Seminarium Astrofizyczne
wtorek 22.11.2016 godz. 12:30
Hoża 69 pawilon sala 22

dr Anna Durkalec
(NCBJ)

Luminosity and stellar mass dependency of galaxy clustering at z~3

Studies at low and intermediate redshift ranges shows that the relation between the luminous structure and underlying dark matter distribution is not straightforward and depend on the various properties of galaxy population. Naturally one would like to extend these studies of the luminous-dark matter relations to the high redshift ranges (z>2) in order to improve our understanding of the evolution of the universe structure.

Therefore, we present an unprecedented study of the dependence of galaxy clustering on luminosity and stellar mass in the redshift range $2 < z < 3.5$ using spectroscopic data from the VIMOS Ultra Deep Survey (VUDS). We present series of results quantified using a power-law approximation of the correlation function and in the framework of the five parameter HOD (Halo Occupation Distribution) model. Similarly as has been shown at lower redshift ranges, we observe that at z~3 the correlation length, and all HOD characteristic masses depends on the luminosity and stellar mass - the bright and most massive galaxies are the ones that are the most strongly clustered and are likely to occupy the most massive dark matter haloes. The comparison with lower redshift measurements shows, however, that the contrast in the DM halo masses, between our most luminous (most massive) and faintest (least massive) galaxies is much strongly pronounced than it is observed local galaxies of similar properties. Moreover, at z∼3, we observe that the halo masses for which a halo hosts, on average, one satellite and one central galaxy, above the threshold luminosity, is $M_1 \approx 4M_{min}$ over the all luminosity ranges, which is significantly lower than observed at z∼0. This implies that at high redshift it is more likely that a halo host a satellite galaxy above a given threshold limit, than locally. Meaning that at z~3 the frequency of halo mergers, that ‘creates’ satellite galaxies exceed significantly galaxy major mergers, responsible for satellites destruction. We conclude our work with studies of the luminous-dark matter relation, through measurements of the large scale galaxy bias. We find it to be (1) significantly higher than observed at the local universe and (2) to be luminosity and stellar mass dependent. We show that going back in time the bias contrast of the most luminous galaxies to the rest of the population becomes stronger, implying that the fainter galaxies are less biased tracers of the mass than the brighter galaxies even at high redshift ranges.

Serdecznie zapraszam,
Agnieszka Majczyna